Black Bear Population Analyses
2005

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Abstract

Bear visitation rates averaged 60% for 18 bait station surveys conducted in the primary range (Zones A, A1, and B), and 30% for 7 surveys conducted in the peripheral range (Zone C). Population models produced a statewide estimate of approximately 10,950 bears in Fall, 2005. Bear populations now appear to be near or slightly below goals in all Bear Management Zones except for Zone C where it is approximately 40% higher than the goal. A harvest of 2,500 bears was recommended for the 2005 season.

Methods

Bear bait station surveys were conducted by wildlife management and research personnel in the 18 counties comprising the primary bear range and 7 counties within the peripheral range in 2005. The surveys were run between 15 June and 15 July, and consisted of 50 bait stations placed at 0.5-mile intervals along drivable roads. A plastic mesh overwrap bag filled with approximately 2 lb. of fresh meat was securely wired to a tree about 7 ft above the ground at each bait station. Bait stations were checked for bear visitations after 7 nights.

A station was considered to have been visited by bears if the bag of meat was gone and the wire securing it had been stretched or broken, or by marks on the trees and/or trails leading to the station. Bait stations were considered inoperable and not included in the calculations if they could not be found or if animals other than bears had taken the bait.

Three-year running average visitation rates ([year x 2 + year^{+1}]/3 for first year; [year^{-1} + year x 2]/3 for last year, and [year^{-1} + year + year^{+1}]/3 for all other years) were used as an independent index to bear population trends. Combining years reduced annual fluctuations resulting from rather small sample sizes and large annual changes in the abundance of natural foods.

All bears legally harvested were registered at DNR or cooperative stations. A lower first premolar was collected as the bears were registered, and the sex and county of kill were recorded for each bear. Registration personnel were provided instructions and envelopes for storing the teeth. Teeth were sent to the Matson's Lab in Milltown, MT for processing, and ages were assigned by counting annuli in the cementum.

Wisconsin's Bear Population Model was adapted from the one developed and used in Minnesota. That model was updated in 2004 to include the most recent bear harvest, age, and bait station data, and used to estimate bear populations in each Bear Management Zone (Figure 1). Starting population size in the model was adjusted in zones A, B, and C in 2003 to improve the correlation between model simulated population trends and trends in bait-station visitations.

Results

Bear visitation rates in the 2005 bait station survey averaged 72% in Zone A, 60% in Zone A1, 49% in Zone B, and 60% in the primary bear range (Zones A, A1, and B combined) (Table 1). Bear visitation rates in Zone C (peripheral range) averaged 30%.

The 3-year mean visitation rates in the primary bear range increased rather steadily from 1985 (32%) to 1996 (55%) and then largely stabilized (1997-2005 average = 55%, Fig. 2). In contrast, the Bear Bait Station Survey suggests a marked increase in the bear population in Zone C during the past 8 years, 3-year average visitation rates increased from 14% to 33% during 1997-2005.

Teeth were collected from 2,576 of the 3,063 bears harvested in 2004. Age has not yet been determined from these teeth. The age structure of bears harvested during 1986-2003 has been relatively stable (Table 2). Mean ages of bears harvested have ranged from 3.1 - 4.3 years for males and 4.2 - 5.3 years for females.

Adjustments made in 2003 to the starting population size for bear population models in zones A, B, and C improved correlations between simulated population trends and trends in bait-station visitations. The models produced a statewide population estimate of approximately 10,950 bears in Fall, 2005 (Table 3). This included 4,350 bears in Zone A, 2,750 in Zone A1, 2,150 in Zone B, and 1,700 in Zone C. The 2005 population estimates equate to bear densities of 0.8 bears/mi^2 of bear range in Zone A, 0.5 bears/mi^2 in Zone A1, 0.4 bears/mi^2 in Zone B, and 0.3 bears/mi^2 of occupied range in Zone C. Population trends calculated by the models for the primary range generally paralleled those suggested by the Bear Bait Station Surveys, but apparent divergence in the trends in the last 3 years suggests that additional recalibration of the models should be considered (Fig. 2). The population model for Zone C suggests a steady increase in the population during 1988-2003. The model suggests the Zone C population may have stabilized in the last few years.

Bear population estimates in Zones A, A1, and B are near or slightly below goals, whereas the bear population estimate in Zone C is approximately 40% above the prescribed goal. The WDNR Bear Advisory Committee recommended a harvest of 2,500 bears for the 2005 season. This included 800 bears in Zone A, 550 in Zone A1, 550 in Zone B, and 600 in Zone C.

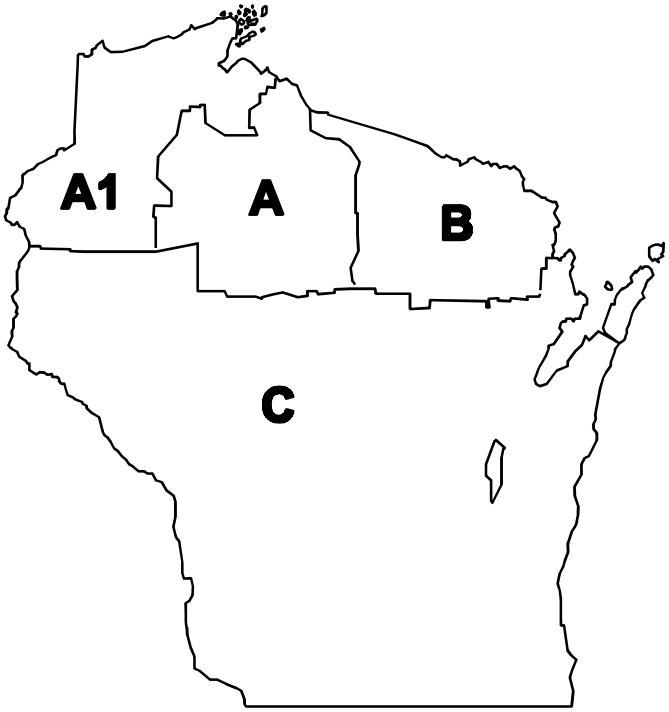

Figure 1. *Wisconsin's Black Bear Management Zones, 2005.*

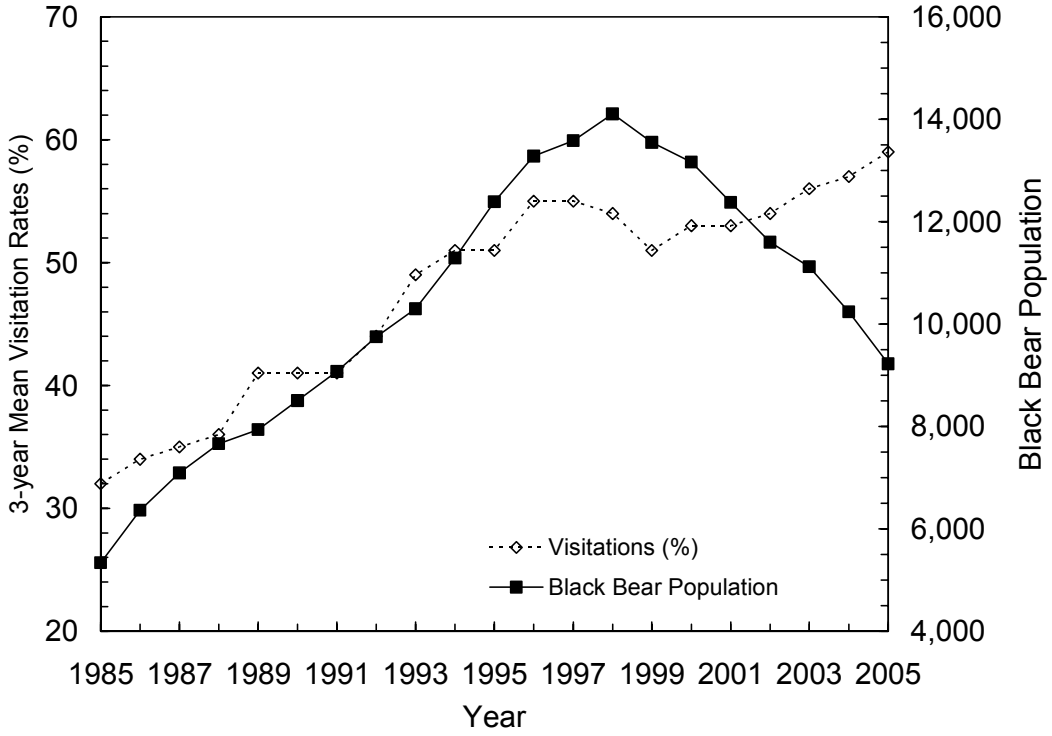

Figure 2. *Bear visitation rates on bait station surveys (3-yr running average) and population estimates calculated by the model for the primary range (Zones A, A1, and B), 1985-2005.*

Table 1. *Percent of bear bait stations visited by bears, 1994-2005.*

County	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Ashland	49	68	79	68	48	68	82	63	51	57	86	71
Bayfield	67	77	67	32	83	83	67	64	79	65	46	75
Burnett	29	23	50	39	63	60	71	84	53	36	32	46
Douglas	33	58	41	43	37	62	61	30	33	33	30	30
Florence	56	50	44	38	46	64	54	----	34	53	67	83
Forest	74	59	66	88	26	43	61	55	58	60	74	62
Iron	58	55	69	86	58	48	41	42	47	55	79	64
Langlade	31	49	45	62	29	30	48	44	56	53	54	63
Lincoln	59	72	60	76	52	41	55	33	68	44	27	30
Marinette	30	7	26	19	26	44	35	39	65	24	47	50
Oconto	7	2	12	16	6	18	6	25	47	28	31	23
Oneida	45	12	32	67	23	66	23	36	63	95	70	48
Price	65	64	66	88	43	31	50	50	42	68	78	26
Rusk	74	64	97	85	71	84	84	91	72	58	80	98
Sawyer	73	52	87	93	66	76	68	91	91	79	67	90
Taylor	19	18	48	46	62	52	42	36	50	57	58	90
Vilas	57	53	57	57	36	52	31	34	26	47	33	32
Washburn	72	91	85	84	60	90	91	74	88	85	84	92
Primary Range	**49**	**48**	**57**	**60**	**47**	**56**	**51**	**52**	**56**	**54**	**58**	**60**
Barron		--	--	16	26	11	30	28	17	11	20	30
Chippewa		30	39	27	15	52	41	20	44	50	42	47
Clark		19	22	6	12	33	16	39	54	52	64	48
Jackson		6	11	13	27	0	28	11	20	15	14	8
Marathon		29	20	32	7	8	13	32	66	69	65	53
Menominee		19	14	14	8	5	46	6	11	9	35	14
Polk		--	--	2	8	4	9	7	2	---	---	---
Shawano		--	0	0	0	0	0	7	0	---	11	0
Peripheral Range		**21**	**17**	**13**	**13**	**14**	**23**	**19**	**27**	**37**	**38**	**30**

Table 2. *Age classes of bears harvested in Wisconsin, 1986-2003.*

		Percent in age class				
Year	Sex	1-2 yr	3-9 yr	10+ yr	No. aged	Mean age
1986	Male	59.5	37.2	3.3	210	3.6
	Female	43.8	41.3	9.9	121	4.2
1987	Male	52.6	43.2	4.2	401	4.1
	Female	41.5	52.0	6.5	200	4.6
1988	Male	60.4	35.0	4.6	439	3.7
	Female	40.9	51.9	7.2	345	4.7
1989	Male	53.9	39.0	7.1	397	4.2
	Female	42.5	47.9	9.6	261	5.0
1990	Male	67.0	30.4	2.6	454	3.4
	Female	46.8	48.1	5.1	331	4.6
1991	Male	56.9	37.3	5.8	448	4.0
	Female	38.9	54.9	6.2	306	4.7
1992	Male	63.9	32.1	4.0	474	3.5
	Female	48.4	45.0	6.6	380	4.3
1993	Male	50.9	41.7	7.4	405	4.3
	Female	37.8	57.3	4.9	286	4.6
1994	Male	62.6	31.4	6.0	441	3.9
	Female	50.9	45.0	4.1	271	4.2
1995	Male	55.7	41.4	2.9	600	3.6
	Female	37.7	52.0	10.5	435	5.3
1996	Male	60.0	37.3	2.7	771	3.6
	Female	46.8	45.6	7.6	536	4.7
1997	Male	65.0	32.6	2.5	765	3.5
	Female	47.9	44.2	7.9	620	4.6
1998	Male	65.0	33.4	1.6	1,134	3.3
	Female	49.0	44.2	6.9	904	4.5
1999	Male	67.6	29.9	2.4	1,058	3.3
	Female	51.5	39.3	9.2	954	4.7
2000	Male	68.1	29.0	2.9	1,227	3.3
	Female	49.8	41.5	8.7	1,046	4.7
2001	Male	67.8	29.2	3.0	1,250	3.4
	Female	51.2	40.8	8.0	1,023	4.6
2002	Male	59.5	34.6	5.9	1,094	3.9
	Female	44.5	43.7	11.8	946	5.2
2003	Male	64.3	33.3	2.4	1,349	3.1
	Female	48.4	43.0	8.2	1,065	4.6

Table 3. *Modeled bear population estimates by Management Zone, 1988-2005.*

	Bear Management Zone				
Year	A	A1	B	C	State
1988	3,500	2,650	1,550	650	8,350
1989	3,500	2,800	1,650	700	8,650
1990	3,650	3,050	1,800	850	9,350
1991	3,850	3,350	1,850	900	9,950
1992	4,050	3,700	2,000	950	10,700
1993	4,150	4,100	2,100	1,000	11,350
1994	4,450	4,650	2,200	1,050	12,350
1995	4,950	5,050	2,350	1,200	13,550
1996	5,600	5,350	2,400	1,200	14,550
1997	5,800	5,400	2,400	1,250	14,850
1998	6,150	5,500	2,450	1,350	15,450
1999	5,900	5,200	2,400	1,400	14,950
2000	5,700	4,950	2,500	1,500	14,650
2001	5,400	4,450	2,500	1,600	13,950
2002	4,950	4,150	2,500	1,600	13,200
2003	4,800	3,800	2,500	1,800	12,900
2004	4,350	3,250	2,450	1,800	12,050
2005	4,350	2,750	2,150	1,700	10,950
Goal	4,600	3,300	2,200	1,200	11,300